# 2.5 mm x 3.2 mm Ceramic Package SMD TCXO

# I547/I747 Series

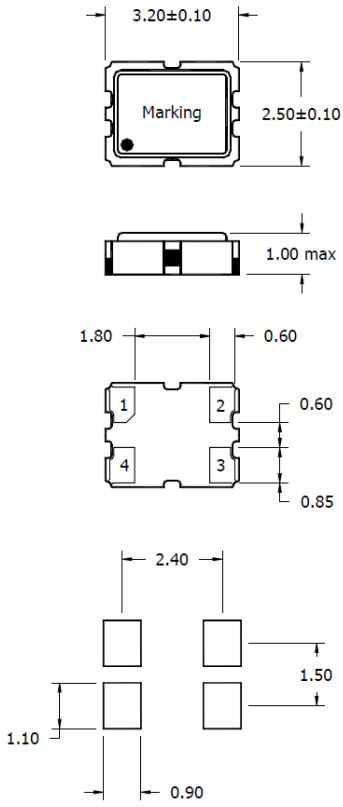
## Product Features:

Clipped Sinewave
Analog Compensation
Available ±0.5ppm Stability
RoHS Compliant / Pb-free

## Applications:

GPS
Smart Meters
Wireless Base Stations
Sonet / SDH
T1/E1, T3/E3

| | |
|---|---|
| **Frequency** | 10MHz to 52MHz |
| **Frequency Tolerance @ 25° C** | ±2.0ppm after second reflow |
| **Frequency Stability**<br>Vs Temperature<br>Vs Supply Voltage (± 5%)<br>Vs Load (10%) | <br>See Part Numbering Guide<br>±0.2ppm Maximum<br>±0.2ppm Maximum |
| **Output Level**<br>Clipped Sinewave | <br>0.8V p-p Minimum |
| **Output Load**<br>Clipped Sinewave | <br>10KOhms / 10 pF |
| **Start Time (90% of Vp-p)** | 3.0mSec Maximum |
| **Aging** | ±1ppm / Year Maximum |
| **Supply Voltage** | See Part Numbering Guide, tolerance ± 5% |
| **Current**<br>≤32MHz<br>>32mHz | <br>1.5mA Maximum<br>2.0mA Maximum |
| **Voltage Control** | 1.5Vdc ±1.0Vdc, ± 5.0ppm Minimum (Only for I747) |
| **Operating Temperature Range** | See Part Numbering Guide |
| **Storage Temperature Range** | -40°C to +85°C |
| **Phase Noise (typical)** | -87 dBc/Hz at 10Hz<br>-112 dBc/Hz at 100Hz<br>-135 dBc/Hz at 1KHz<br>-145 dBc/Hz at 10KHz |
| **Compensation** | Analog |




**Suggested Land Pattern**

| PIN CONNECTIONS | | |
|---|---|---|
| PIN 1 | I547 | Ground or No Connect |
| | I747 | Control Voltage |
| PIN 2 | | Ground |
| PIN 3 | | Output |
| PIN 4 | | Supply Voltage |

**Dimensions in mm**

## Part Numbering Guide

| Sample Part Number: I547-1Q3-20.000 MHz | | | | |
|---|---|---|---|---|
| **Package** | **Operating Temperature** | **FrequencyStability vs Temperature** | **Supply Voltage** | **Frequency** |
| I547 (Clipped Sinewave TCXO)<br>I747 (Clipped Sinewave TCVCXO) | 7 = 0°C to +50°C | *, ** Y = ±0.5ppm | 3 = 3.3V | - 20.000 MHz |
| | 1 = 0°C to +70°C | *N = ±1.0ppm | 7 = 3.0V | |
| | 3 = -20°C to +70°C | *O = ±1.5ppm | 8 = 2.8V | |
| | 5 = -30°C to +85°C | *P = ±2.0ppm | 2 = 2.7V | |
| | 2 = -40°C to +85°C | Q = ±2.5ppm | 1 = 1.8V | |
| | | R = ±3.0ppm | | |
| | | J = ±5.0ppm | | |
| ***** Not available for all frequencies or temperature ranges.<br>****** Referenced to the midpoint between minimum and maximum frequency value over Operating Temperature Range. | | | | |

**NOTE:** It is recommended that a 0.01µF bypass capacitor be connected between Vdd (Pin 4) and Ground (Pin 2) to minimize power supply noise.
It is recommended that an external 0.01µF AC-coupling capacitor be connected to output (Pin 3) of the device.
For the TXCO (I547), it is recommended that Pin 1 should not be left floating but be connected to Ground.

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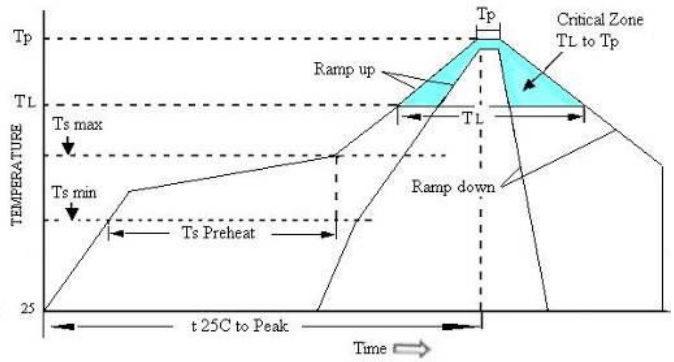
## Pb Free Solder Reflow Profile:



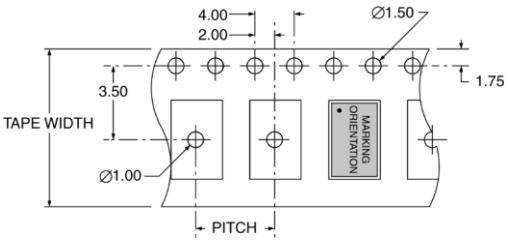

Units are backward compatible with +240˚C reflow processes

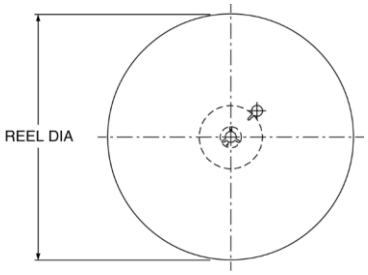
| | |
|---|---|
| Ts max to $T_L$ (Ramp-up Rate) | 3°C / second max |
| Preheat<br>Temperature min (Ts min)<br>Temperature typ (Ts typ)<br>Temperature max (Ts max)<br>Time (Ts) | <br>150°C<br>175°C<br>200°C<br>60 to180 seconds |
| Ramp-up Tate ($T_L$ to Tp | 3°C / second max |
| Time Maintained Above<br>Temperature ($T_L$)<br>Time ($T_L$) | <br>217°C<br>60 to 150 seconds |
| Peak Temperature (Tp) | 260°C max for 10 seconds |
| Time within 5°C to Peak Temperature (Tp) | 20 to 40 seconds |
| Ramp-down Rate | 6°C / second max |
| Tune 25°C to Peak Temperature | 8 minutes max |

## Package Information:

MSL = 1 (package does not contain plastic, storage life is unlimited under normal room conditions)
Termination = e4 (Au over Ni over W base metallization)

## Tape and Reel Information:




| | |
|---|---|
| PITCH | 4.00 |
| TAPE WIDTH | 8.00 |
| REEL DIA | 180 |
| QTY PER REEL | 3,000 |

## Tape and Reel Information:

| | |
|---|---|
| Thermal Shock | MIL-STD-883, Method 1011, Condition A |
| Moisture Resistance | MIL-STD-883, Method 1004 |
| Mechanical Shock | MIL-STD-883, Method 2002, Condition B |
| Mechanical Vibration | MIL-STD-883, Method 2007, Condition A |
| Resistance to Soldering Heat | J-STD-020C, Table 5-2 Pb-free devices (except 2 cycles max) |
| Hazardous Substance | Pb-Free / RoHS Compliant |
| Solderability | JESD22-B102 Method 2 (Preconditioning E) |
| Terminal Strength | MIL-STD-883, Method 2004, Test Condition D |
| Gross Leak | MIL-STD-883, Method 1014, Condition C |
| Fine Leak | MIL-STD-883, Method 1014, Condition A2, R1=2x10-8 atm cc/s |
| Solvent Resistance | MIL-STD-202, Method 215 |

## Marking:

Line 1: I-Date Code (YWW)
Line 2: Frequency